

NewsRelease

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NEW JERSEY COMPANY TO REFINE NASA TECHNOLOGY

Refined NASA Technology May Replace Dentist's Drill

In the near future, a laser device inspired by NASA may replace the dentist's drill. Flip a switch and it will also replace the dentist's razor-sharp scalpel. And the best part: It's virtually painless and requires no anesthesia for most patients.

Lasers exist today that work on hard tissue like teeth to prepare the tooth for filling and on soft tissue for gum treatment and oral surgery, but only five percent of approximately 140,000 practicing dentists in the U.S. use a laser system.

Now, researchers at NASA Langley Research Center, Hampton, Va., have demonstrated that two of the laser wavelengths approved by the FDA for dental applications can be produced from a single, easy-to-use system. This development is expected to result in an increased interest in and use of lasers in the dentist's office.

"The dual system is simple because we've already done all the complex physics in the lab," said Langley laser researcher Keith Murray, one of three inventors of the dental laser technology. The other inventors are Norman Barnes, also of Langley's Laser Systems Branch and Ralph Hutcheson of Scientific Materials Corp., Bozeman, Mont.

Both wavelengths can be produced using the same hardware. Switching between the two wavelengths is accomplished by selecting the amount and rate of energy pumped into the specially-designed laser system. The resulting hardware is about one-half the size of two distinct laser systems and does not require the laser system to be "tuned" by the operator.

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Lantis Laser, Inc., Hewitt, N.J., is working with NASA Langley to refine the performance of the technology to explore its potential as a commercial dental laser product. Under the terms of a Space Act Agreement, a Lantis scientist will perform research in a Langley lab with help from the technology's inventors. Assuming FDA approval of the technology by mid-2001, the goal is to begin sales of the device by the end of 2001. According to company projections, each one percent of market share of the American dental market for this dual wavelength technology represents approximately \$40 million in sales.

Dr. Craig Gimbel is a dentist, co-founder of Lantis and a principal investigator for the FDA clinical trials that led to the May 1997 approval of lasers for hard-tissue dentistry. Dr. Gimbel believes both patients and dentists would find much to like about a dental laser. "Filled teeth can be stronger," according to Dr. Gimbel, "because a laser removes less of the healthy tooth for filling. And the dentist feels more comfortable when the patient feels more comfortable. When I don't have to use a dental drill, or I don't have to use a scalpel, or I don't have to use anesthesia in all procedures, I feel better and, of course, my patient does."

A dual wavelength laser would provide the additional benefit of minimizing blood flow during surgery by searing the cut.

In addition to the dual wavelength laser, Lantis also plans to commercialize a coherent light-based imaging technology. This imaging system would provide early detection of tooth decay and gum disease, allowing the minimally invasive treatment laser announced today to be used to its best advantage.

The discovery of the two-wavelength technology is a spin-off of work to develop high power lasers for remote sensing of the atmosphere, a key element in NASA's atmospheric sciences mission. The technology has also been used in aeronautics research including measurements of winds, wind shear and turbulence in flight and measurement of wake vortices from the ground in airport terminal areas. Those investigations led to the discovery that it is possible to selectively produce two or more useful wavelengths from a single laser source.

For information about business opportunities with NASA, check the Internet at:

<http://tech-transfer.larc.nasa.gov/>

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Editor's Note: For more information or still images contact Keith Henry at h.k.henry@larc.nasa.gov. B-roll and soundbite video is available that includes animation of the dual wavelength laser and the technology's original aviation application. For video, contact Ivelisse Gilman at 757/864-5036 or i.gilman@larc.nasa.gov.